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Received: from uro (localhost.theporch.com [127.0.0.1]) by uro.theporch.com  
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Date: Fri, 3 May 1996 22:26:00 -0500 (CDT)  
Message-Id: <199605040326.WAA11834@uro.theporch.com>  
Errors-To: ws4s@midtenn.net  
Reply-To: glowbugs@theporch.com  
Originator: glowbugs@theporch.com  
Sender: glowbugs@theporch.com  
Precedence: bulk  
From: glowbugs@theporch.com  
To: Multiple recipients of list <glowbugs@theporch.com>  
Subject: GLOWBUGS digest 177  
X-Listprocessor-Version: 6.0c -- ListProcessor by Anastasios Kotsikonas  
X-Comment: Please send list server requests to listproc@theporch.com  
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#### GLOWBUGS Digest 177

Topics covered in this issue include:

- 1) Fuse rebuilding  
by rdkeys@csemail.cropsci.ncsu.edu
- 2) Lamb bulb resistances for experimental use  
by rdkeys@csemail.cropsci.ncsu.edu
- 3) World's Simplest Field Strength Meter  
by rdkeys@csemail.cropsci.ncsu.edu
- 4) Re: Fuse rebuilding  
by rdkeys@csemail.cropsci.ncsu.edu
- 5) Regenerative receiver love rekindled  
by herr@ridgecrest.ca.us (Michael Herr)
- 6) Re: Fuse rebuilding/funzies  
by rdkeys@csemail.cropsci.ncsu.edu
- 7) The 69er  
by Jeff Duntemann <jeffd@coriolis.com>
- 8) Re: The 69er  
by "Deane D McIntyre" <dmcintyr@acs.ucalgary.ca>
- 9) Could there be a 1-tube superhet?  
by Jeff Duntemann <jeffd@coriolis.com>

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Date: Fri, 3 May 1996 12:55:57 -0400 (EDT)  
From: rdkeys@csemail.cropsci.ncsu.edu  
To: glowbugs@theporch.com, boatanchors@theporch.com  
Cc: rdkeys@csemail.cropsci.ncsu.edu ()  
Subject: Fuse rebuilding

Message-ID: <9605031655.AA102172@csemail.cropsci.ncsu.edu>

Whilst attempting to resurrect a fine old ancient mariner, I ran out of HV fuses (the originals had rotted away in storage before I got the beast). My last spare is used up and I get deep willies trying to just bypass them.

Thinking that somewhere in the deep dark reaches of the past I had seen a table of fusing currents for plain copper wire, I looked and looked and searched high and low and was unable to find that table. By sheer chance, last night, while going through a bunch of papers, I found the long lost treasure. Now I am able to reconstruct my HV fuses. So that others may not have to scratch their heads like I did, and hopefully so others may contribute to the table and make it available on the archives I will type in what I have.

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Fusing Effects of Current on Copper Wire  
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(Note --- the original source for this is long lost, but it may have been in an old 50's or earlier Handbook of Chemistry and Physics.)

B&S Guage	Fusing Current in Copper Wire
-----	-----
10	333
12	235
14	166
16	117
18	83
20	58
22	41
24	29
26	21
28	15
30	10
32	7.3
34	5.1
36	3.6
37	3.1
38	2.5

39	2.2
40	1.8

Maybe someone else has other values for other metals that might be usable. Perhaps aluminum wire might also be good in a pinch, if anyone has tables of fusibility for aluminum. For most purposes, it is probably best to stick with copper.

We checked for makers of HV fuses, and no-one makes them anymore that we can find. Also, cartridge fuses in the large cartridges are no longer being made. But, such fuses can be rebuilt if you can find the fuse links or the right size of fusible wire. Currently I am using individual strands of stranded copper wire (No. 40 or smaller) on some of my HV fuses, and it seems to work OK. Handling that size wire is sometimes a problem to prevent breakage, but one has to make do these days with what one can find, just like in the early days.

Good Luck

73/ZUT DE NA4G/Bob UP

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Date: Fri, 3 May 1996 13:28:28 -0400 (EDT)  
From: rdkeys@csemail.cropsci.ncsu.edu  
To: glowbugs@theporch.com, boatanchors@theporch.com  
Cc: rdkeys@csemail.cropsci.ncsu.edu ()  
Subject: Lamb bulb resistances for experimental use  
Message-ID: <9605031728.AA102247@csemail.cropsci.ncsu.edu>

Another treasure surfaces from the deep dark recesses and bilges.

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TABLE OF TUNGSTEN LAMP RESISTANCE VALUES  
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(Note: the original source for this is long lost, but it has ``Popular Science Monthly Shop Data'' written on the xerox that it came from.)

Lamp Wattage -----	Approximate Resistance in Ohms				
	Cold	25%	50%	75%	100%
6	193	1390	1837	2127	2400
10	113	822	1094	1293	1440
15	73	540	722	856	960
25	42	318	427	509	576
40	25	173	253	299	360
50	21	141	206	241	288
60	17	117	171	201	240
75	12	98	136	154	192
100	10	77	104	116	144
150	7	48	69	84	96
200	5	36	51	62	75

Note: Percentages are in percentages of 120vac applied across the bulb while it is used as a series resistor.

Looking at the table, one can easily see why a 200 watt lamp makes such a good dummy load for the average coax fed rig --- it is within the 30-100 ohm range at all output powers. Also, at MF and HF, the inductance and series effects of using a coil in a filament as a resistor are essentially nil. For open wire feeders, choose a power and resistance rating for your rig and open wire impedance 300-600 ohms.

Using such a table, one can easily use lamp resistances as series current limiters for battery charging, etc. In my chargers, they drop about 24 volts to a 6 or 12 volt battery, so I use the 25% column, and it works quite well. Also, series lamps make great bleeder loads when run at about 25 percent power or so, and it will stabilize your power supplies on OT rigs, quite well. 4 watt christmas tree lamps or 7.5 watt night lamps work quite well in this vein, for light loading and 10 or 15 watters work well for heavier loading. Use one bulb for every 60 volts of HV to bleed (Yeah, I know that is a lot of lamps, but they sure glow nicely and keep the shack warm in winter!).

The basics of the use of lamp bulb resistances are well covered in two QST articles, suitable for all amateur, and especially all boatanchorite and glowbuggite uses.

1. Redgrave, D.C., KA1NA. The light-bulb resistor. QST, March, 1934, pages 36-37.

2. Hamburger, F., Jr., W3AMM. The incandescent lamp as a resistor.  
QST, July, 1934, page 31.

Good Luck

73/ZUT DE NA4G/Bob UP

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Date: Fri, 3 May 1996 13:44:10 -0400 (EDT)  
From: rdkeys@csemail.cropsci.ncsu.edu  
To: glowbugs@theporch.com, boatanchors@theporch.com  
Cc: rdkeys@csemail.cropsci.ncsu.edu ()  
Subject: World's Simplest Field Strength Meter  
Message-ID: <9605031744.AA102298@csemail.cropsci.ncsu.edu>

Another treasure surfaced from the bilges.....

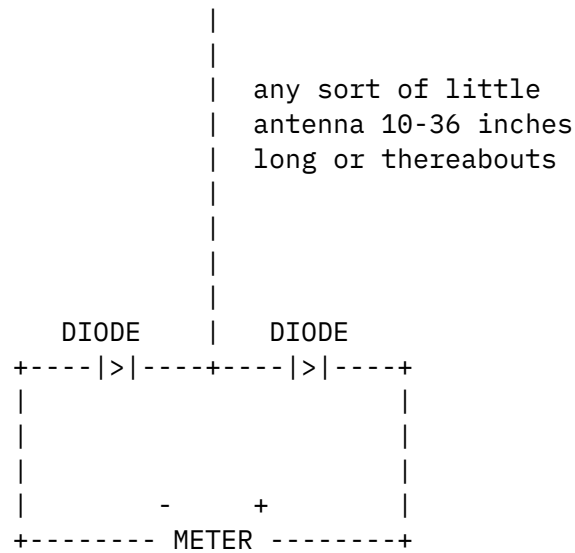
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WORLD'S SIMPLEST FIELD STRENGTH METER  
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(Note: the source for this was an obscure article in 73 magazine, some years back, but I can't find the original citation for it.)

Have you ever needed to tune up your OT rig and not been able to use a normal ``SWR meter''? After all, OT rigs never knew what SWR was anyway. It is essentially a null item on OT rigs fed with tuned lines or no lines. My OM, a sparks since the earliest days, always tuned with a field strength meter, even when running commercial gear. It worked for 70 years for him, and has for 25 years for me.

The following circuit is ascribed to Jo Jennings/W6EI (SK). It was written up for 73 in a short half page article by Lloyd M. Jones/W6DOB. I have been teaching all my classes in Ham Radio, using this device for instructional purposes, since it really, really works! Even newcomers can get a grip on it and make it work, the first time. One does not even need a case for the meter.

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73/ZUT DE NA4G/Bob UP

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Date: Fri, 3 May 1996 13:59:20 -0400 (EDT)  
 From: rdkeys@csemail.cropsci.ncsu.edu  
 To: bill@skeeter.frco.com (William Hawkins)  
 Cc: rdkeys@csemail.cropsci.ncsu.edu (), boatanchors@theporch.com,  
 Subject: Re: Fuse rebuilding  
 Message-ID: <9605031759.AA102336@csemail.cropsci.ncsu.edu>

>  
 > Um, there's more to it than just melting the wire. The arc has to be  
 > controlled - especially at high voltage. Are you talking about the  
 > cartridges that have end caps that screw on to hold the wire \_and\_  
 > are filled with powder?

I am talking about the paper fuze cartridges that are used in things  
 like the BC-191 and BC-375, TCM, TDB, and many other ancient transmitters  
 for which replacements are non-existent. These are the 2 or 4 inch long  
 tubes with brass end caps. They are use in the B+ lines and in high  
 current filament lines, etc. They are not used in primary lines.

I have to disagree slightly in that there is nothing more to it than  
 letting the fuse link blow (except for containing the fire as the wire  
 fuses). All that the link has to do is open at a reasonable approximation  
 to the desired current. Of course, if one is constructing one from

scratch, then it should be properly insulated and properly fireproofed so you don't catch the rig or the house afire. That is obvious.

> There's also 'clearing time' and overcurrent characteristics, that  
> usually dictate some alloy - not copper. That's not as important as  
> having \_something\_ for a fuse, but copper can allow pretty high peak  
> fault current. I'd be sure that there were real fuses in the connection  
> to the power company, on the primary side of the HV transformer.

We are talking about secondary fusings here, where non-existent fuse cartridges or links exist anymore. I would not suggest anyone do this in the primary side --- use normal fuses for that, replacing holders if necessary. But, have you tried to find a 2000 volt 250ma fuse, lately? These you may have to rebuild.

What I do is carefully remove the end caps from the paper or bakelite tube and then install replacement copper wire fuse link. It has always worked fine for me. If the fuse link is within, 200% of original value, that will usually work just fine in normal kinds of BA applications where no currently available replacements exist. Usually, I choose one step less in fusing current just to be on the safer side. That is usually 40 or smaller wire sizes.

The only other alternative that I can think of, in a practical sense, would be to wire up pigtails on 250v fuses and use those as replacement insert fuse links, in these cartridges. I am not sure these would work any better.

If anyone has any other insights into this, kindly let me know, OK?  
I have been plagued with this non-existent fuse link problem for some 20 years now, and the fusible copper links are the only thing that I can find that suitably replaces originals, long since unavailable.

> Bill Hawkins

Thanks for the concerns, Bill.

73/ZUT DE NA4G/Bob

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Date: Fri, 3 May 1996 10:31:27 -0700 (PDT)  
From: herr@ridgecrest.ca.us (Michael Herr)  
To: glowbugs@theporch.com  
Subject: Regenerative receiver love rekindled

Message-ID: <v01530500adb0e2e1ae97@[199.120.150.38]>

Hello gang,

I dusted off the old HeathKit regen receiver model GR-81 the other night and fell in love. It's a small box receiver with the 3 tube configuration (detect, audio and rectifier). As a kid of 12 or so year I had built it after picking prunes one summer to earn the money. Back then I enjoyed listing to the broadcasters and amateurs alike. I packed it away and forgot about it. Well, the other night I decided to listen to 160. Not having a receiver for it I remembered the regen and pulled it out. Firing it up I reacquainted my self with regen operation. Since that first night I've had a blast! No digital readout, no AM / SSB selection. Signals don't sit there and present themselves like a local FM station but rather they have to be coaxed, tickled as it was to show their head and then after working on it the station finally comes forward. A lot like catching a 10 pound catfish on a 2 pound line. A lot like QRP. One has to listen to the signal and understand what is happening, not just look up the frequency and punch it in! What a ball! I think it's now time to get back to the 3A4 rig I was working on.

72

Mike WA6ARA

ps - anybody remember an article on a rig based upon the 6T9 tube? I believe there was an AM version of it. I think it may have made one of the ARRL handbooks.

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Date: Fri, 3 May 1996 14:39:07 -0400 (EDT)  
From: rdkeys@csemail.cropsci.ncsu.edu  
To: pbock@melpar.esys.com (Paul H. Bock)  
Cc: rdkeys@csemail.cropsci.ncsu.edu (), boatanchors@theporch.com,  
Subject: Re: Fuse rebuilding/funzies  
Message-ID: <9605031839.AA102443@csemail.cropsci.ncsu.edu>

>

> Boy, you guys would love how they handled fuses in Morocco  
> when I lived there.....I was staying in the hotel in Kenitra (nee  
> Port Lautey) and the circuit serving my room went dead. I  
> happened upon the Duty Electrician in the hall changing the fuse  
> - well, actually, he removed the cover from a Large Porcelain Box  
> which looked like it had been built about 1910, and pulled out a  
> porcelain block with heavy brass prongs on either end, and  
> proceeded to carefully wind several turns of what looked like  
> ordinary solder around the two prongs to "connect" them, then



> plugged the sucker back into the Large Porcelain Box and voila! -  
> my room again had electricity.  
>  
> 73,  
> Paul, K4MSG

EEK!

Paul.... from the practical point, I wonder if anyone has done any experimentation (at the ham level or in commercial or laboratory settings, since it seems we need to have that kind of authority), on using this ``solder'' alloy sort of fusible link. Is there any way to backtrack and find out what exactly was used as that link?

I have seen lots of spools of some sort of hairlike extremely fine solder around here lately from a company that went belly up. It looks like about no. 35 or smaller solder wire. The only problem I would have with that approach is that the solder contains resin which will burn, hence would not be suited to use as good a fusible link as would a plain metal.

Anyone else seen these early type fusible link systems around?

Since my hind quarters ride on these kinds of fuses, I do have a vested interest in making sure such things really do work. I know my copper links work, since I have inadvertently blown one or two over the years.

Can anyone cite some literature on fuses, early or modern, preferably good sound technical material? The earliest thing I can find relating to radio is from Loomis (1925) who recommends plate circuit fusing on tubes greater than 5 watts output power. ``Appropriate fuses may be purchased, or they may be made from tinfoil. The tinfoil melts easily if an overload of current passes over it. The right size may be determined by experimentation. If a memorandum of the size of the strip is preserved, it is thereafter only necessary to cut a new fuse as needed. The tinfoil is easier to handle if pasted to bristleboard. Contact is made with small clips." She also references earlier that ``The cartridge fuse consists of a piece of wire, or a flat strip of an alloy of lead and tin, imbedded in a mixture of asbestos and chalk, and held in a fiber cartridge shaped container, having copper or brass caps at each end which fit into copper clips, thus making contact with the circuit.''  
In this case she references the use of a wire as opposed to an alloy strip as a fusible material. Other classic writers, such as Ghirardi or Bucher don't even mention fuses at all.

As No. 5 Alive used to say, .....``Need input!''

Bob/NA4G

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Date: Fri, 3 May 1996 12:36:28 GMT  
From: Jeff Duntemann <jeffd@coriolis.com>  
To: glowbugs@theporch.com  
Subject: The 69er  
Message-ID: <199605031236.MAA18117@ns1.indirect.com>

Mike WA6ARA said:

ps - anybody remember an article on a rig based upon the 6T9 tube? I believe there was an AM version of it. I think it may have made one of the ARRL handbooks.

If you mean a small 5-watt CW transmitter, yes--not only do I know where the circuit is, I built it, and have it on my shelf. I pulled the power transformer for another project some years ago, but if I find another transformer that'll fit in that space (I built it small) it could live again.

I'm not aware of a version that puts out AM. The original circuit was published in QST about 1975 (I'll check tonight when I get home, where all my circuit files are) and it was designed by Lew McCoy.

I called it the 69er, which was a pun on 6T9er. It really had no catchy name in the original article.

As a project it was tricky to build because there are \*12\* pins on a Compactron tube, and getting all the damned components connected to the socket was a very fussy business. On the other hand, it made for a very small, very tight rig for 5W out.

Compactron tubes are fairly abundant and cheap, because they appeared at the End of Things, and there were gazillions of them in boxes on TV shop shelves around the country when tube equipment kind of went away. I built another Compactron project in 1966 that's worth mentioning: A regenerative radio from a Pop Electronics article called "One Tube--All Bands" or something close to that. I forget the number of the tube right now, but it was a triple triode with one for the detector and two for audio. It drove a speaker to earsplitting volume, and shook the house on the downbeat when WWV hit the hour. (WWV's late and lamented CW ID was the first CW I ever heard, a thunderous, authoritative announcement that I can still hear from any of several radios in my history.)

The radio had a defect common to any simple "all-band" regen: By using a 365 pf main tuning cap, tuning was \*very\* touchy, as the tiniest angular force on the shaft would send the passband skittering hundreds of cycles up or down the band. CW and especially SSB were murder to tune in. AM BC and SW was much better, and that's most of what I used it for.

I lost the magazine with the article long ago, but some years back I found an old RCA hobbyist project book that basically reprinted the article. It was a fun project but I do NOT recommend it for amateur band use.

I've learned a lot about designing regen radio coils over the years, and when I get a moment I'll write it up and summarize it here. I wound one the other night on a Safeway One-A-Day vitamins bottle, which miraculously \*just fits\* an octal tube base into its neck. Two self-tapping 6-32's and you're there.

--73--

--Jeff Duntemann KG7JF  
Scottsdale, Arizona

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Date: Fri, 3 May 1996 14:17:55 -0600  
From: "Deane D McIntyre" <dmcintyr@acs.ucalgary.ca>  
To: glowbugs@theporch.com, jeffd@coriolis.com  
Subject: Re: The 69er  
Message-ID: <9605032017.ZZ17920@ds1.acs.ucalgary.ca>

In message <199605031236.MAA18117@ns1.indirect.com> writes:

>  
> Mike WA6ARA said:  
>  
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>  
>  
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>  
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> published in QST about 1975 (I'll check tonight when I get home, where all  
> my circuit files are) and it was designed by Lew McCoy.

The CW rig is in the early 70's ARRL Handbooks (1973 anyhow). The AM rig also using the 6T9 (two if I remember correctly) is in the late 60's Handbooks (1969 anyhow). 6T9's are cheap from Antique Electronic supply (something like \$2.30). I ordered a few a couple of months ago for use in one (or both) of these projects...have not got around to it yet (story of my life).

>Compactron tubes are fairly abundant and cheap, because they appeared at the  
>End of Things, and there were gazillions of them in boxes on TV shop shelves  
>around the country when tube equipment kind of went away. I built another  
>Compactron project in 1966 that's worth mentioning: A regenerative radio  
>from a Pop Electronics article called "One Tube--All Bands" or something  
>close to that. I forget the number of the tube right now, but it was a  
>triple triode with one for the detector and two for audio.

Sounds like another fun project. The possible tubes would be 6MD8, 6MJ8, 6MN8, 6J9 or 6U10. Do any of these sound familiar, there are likely others?

73, Deane D McIntyre VE6BP0  
dmcintyr@acs.ucalgary.ca

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Date: Fri, 3 May 1996 14:41:26 -0700  
From: Jeff Duntemann <jeffd@coriolis.com>  
To: glowbugs@theporch.com  
Subject: Could there be a 1-tube superhet?  
Message-ID: <199605032141.0AA10388@ns2.indirect.com>

Deane said:

>Sounds like another fun project. The possible tubes would be 6MD8, 6MJ8,  
>6MN8, 6J9 or 6U10. Do any of these sound familiar, there are likely others?

I'm pretty sure it was the 6U10. I'll find the circuit and describe it here by Monday. It was fun, but it was NOT a ham receiver. You'd have to completely rethink the coil/tuning cap arrangement, but hey, Are We Not Men? Might be worthwhile, tho I'm unlikely to do it myself. I rarely build the same circuit twice.

But here's a question: Is it possible to build a 1-tube superhet?? Some of those late-era compactrons had a LOT of stuff in them. Suppose we used a signal diode for the detector. Is there a Compactron (or any multipart tube) with enough guts to be a superhet all by its lonesome? That would be one HELL of a cool project.

You could do without an RF amp and AGC. You'd still need an oscillator section, a mixer section (or one converter section) plus an IF amp and an audio amp. Without requiring speaker volume you would need only one audio stage. To me that sounds just barely possible. Anybody got a complete listing of Compactron tubes? Is there a bottle with the balls to pull it off?

I've never yet built a tube superhet. This one I would make time to build.

--73--

--JD--

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End of GLOWBUGS Digest 177

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